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FEDERAL-GRANT RESEARCH
at the
STATE AGRICULTURAL
EXPERIMENT STATIONS

Projects on

ANIMAL HUSBANDRY

Part 4, Section b

Sheep & Goats

Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

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The State Experiment Stations Division, Agricultural Research Service, U.S. Department of Agriculture, Washington 25, D. C., for use of workers in agricultural research in the subject-matter areas presented. For information on specific research projects write to the Director of the Station where the research is being conducted.

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Contents

INTRODUCTION

This compilation is one of a series providing information on State agricultural experiment station research supported by Federal-grant funds appropriated annually by Congress under authorization of the Hatch Act of 1887, as amended and approved Aug. 11, 1955, and Section 204 (b) of the Agricultural Marketing Act of 1946. It is prepared for use by research workers in the subject-matter areas presented. Only that part of each State's research program supported by Federal-grant moneys is included.

In addition to the Federal-grant moneys, the State experiment station receive some Federal support through cooperative agreements or contracts with the U. S. Department of Agriculture. Information on such research, along with other departmental research, is available in the Central Project Office, Agricultural Research Service.

A substantial part of each State agricultural experiment station's research is supported with moneys appropriated by the respective State or Territorial Legislatures and through other forms of private and public financing. Information on current agricultural research at the stations which is not financed under the Federal-grant program or through USDA cooperation can be obtained from experiment station directors.

The information given in the series of Federal-grant compilations includes the title and objectives of each Federal-grant project pertaining to the subject given on the cover. The identification of each project gives the department(s) conducting the research, the station number of the project, and the number of the regional project if it is a contributing project.

Relevant regional projects, if any, appear at the end of the compilation. States having projects contributing to regional projects are indicated. The Roman numeral (and capital letter) refer to the location in the summary of the contributing project title and objectives. The States are grouped into four major regions. These are designated NC-North Central, NE-Northeastern, S-Southern, and W-Western. The capital letter "M" following the letters for the region indicates regional marketing projects.

SHEEP AND GOATS

BREEDING

Ala. Selection and Management of Sheep for Early Lamb Production in Alabama. To (1) compare various existing breeds and strains of sheep for spring lamb production in State; (2) develop strains or lines of sheep specifically adapted to early lamb production by selection for early lambing and prolificacy of the ewe, birth weight, weaning weight, grade of the lamb, and weight and market desirability of wool from breeding flock; (3) study seasonal variation in semen quality and in age of puberty and date of termination of anestrus of ewes within various strains or lines; and (4) study relation of nutrition and management of pregnant ewe to birth weight, percentage survival, and weaning weights of lambs.

Anim. Husb. and Nutr. 109 (S-29) Coop. ARS

Ariz. Farm Flock Sheep Production on Southwestern Irrigated Pastures. To (1) learn economic feasibility of farm sheep production in Yuma area; and (2) compare total production from 2 breeding practices; Grading-up Rambouillet range ewes, using purebred Rambouillet rams, or rotational crossbreeding program using Rambouillet, Suffolk, and Lincoln rams on grade range ewes.

Anim. Sci. 403 Coop. ARS

Ark. The Development and Study of Inbred Lines of Sheep, With Respect to Their Behavior in Line Crosses. To (1) breed improved strains of sheep within present purebred breeds better adapted to conditions in state than purebreeds now available; and (2) test and select for general and specific combining ability of developed strains from 2 inbred lines of Hampshires, 1 line of Southdowns, and a line of Suffolks.

Anim. Indus. 332 (S-29)

Ga. The Relative Productive Value of Various Crossbreeding Systems for Use with Livestock. To learn (1) productive value of crosses and rotational breeding systems; (2) how single and double crosses compare, and comparison with a random-bred population; (3) comparison of 2, 3, and 4 lines or populations used in a rotational program, with single and double crosses, and with a random-bred population; (4) how many different populations should be used in a rotational program to get maximum economic performance; and (5) how performance of a rotation can be predicted from lines performance or single cross performance. Mice used as test animals.

Anim. Husb. 318

Idaho — A Study of Systems of Breeding Sheep for the Development of Superior Strains. To (1) study methods of sheep improvement through breeding; (2) obtain data to be used in developing indices; and (3) develop superior and better adapted strains through selective breeding and record of performance testing.
Anim. Husb. 217 Coop. ARS

Ind. — Evaluation of New Concepts in Quantitative Genetics with Laboratory Organisms. To (1) utilize Triboliumcastaneum as biological check on results obtained with Drosophila melanogaster in comparing various breeding methods; (2) learn effectiveness of various breeding methods for improving performance of plateaued populations; (3) determine with Drosophila and Tribolium the relative effectiveness of a recently proposed modification of Reciprocal Selection; (4) determine genetic mechanism of heterosis or hybrid vigor in Drosophila by genetic fractionation of plateaued populations and single cross hybrids with "Marked Inversion Technique"; and (5) utilize Drosophila and Tribolium for biological evaluation of other new concepts arising in quantitative genetics.
Poultry Sci., Agr. Statis. 920 (NC-47) Coop. ARS

Ky. — Selective Breeding for Earlier Lambing in Purebred Southdown Sheep. Selective breeding for early lambing in an attempt to develop strains or lines with higher reproductive efficiency during late summer.
Anim. Indus. 263 (S-29)

Miss. — Selection for Early Lambing. To (1) determine effectiveness of selection on changing average lambing date in a flock of heterogeneous ewes, including selection of ewes on basis of age at puberty, and selection of rams on basis of progeny tests of dams; and (2) study age at puberty in both sexes, its heritability, its importance and possible relationship to early lambing.
Anim. Husb. HE-6

Mont. — Improvement of Mutton Type and Wool Characteristics of Rambouillets Through Selection and Breeding. To conduct a breeding program with Rambouillet sheep to improve their body conformation and lamb production and increase quality and quantity of clean wool.
Anim. Indus. and Range Mgt. 80, M.S. 710 Coop. ARS

Nev. — The Improvement of Sheep for Nevada Range Through Development and Crossing of Inbred Lines. Develop through rapid inbreeding a number of small inbred lines of sheep from unrelated sources and test lines through top crosses on unrelated stock and crosses with other lines of sheep.
Anim. Husb. 11 Coop. ARS

Nev. Recurrent Selection of Mutton Type Sires for Use on Fine Wool Type Range Ewes. Learn value of recurrent selection in developing mutton type sires for use on fine wool type range ewes.
Anim. Husb. 13 Coop. ARS

N. Mex. Introduction of Variations in Uniform Populations to Give Increased Possibilities for Selection of Better Producing Sheep. To (1) compare introduction through sire of extreme variations into uniform lines of low and high producing fine wool ewes; (2) compare first objective with use of high producing fine wool sires of same line as ewes on low and high producing fine wool ewes; and (3) determine which method will give greatest production of one half blood or fine wool and most lamb production.
Anim. Husb. 26

N. Mex. Genetic Studies on Economic Characters in Sheep. To determine type of inheritance involved in expression of certain designated characteristics in sheep, involving studies to determine (1) number of genes involved with expression of each character; (2) presence or absence of sex linkage; (3) presence or absence of autosomal linkage; and (4) type of genetic variation.
Anim. Husb. 13

N. Mex. Mature and Lifetime Records as Guides for Wool Production and Body Development in Sheep. To determine (1) age at which sheep are mature under environmental conditions found in N. Mex.; (2) variations in amount of wool and body development at different ages and under different environmental conditions; (3) measurements of wool and body and develop one or combinations into a formula to give more reliable estimates of lifetime production of wool and body; and (4) how many years are needed to give a good measure of lifetime production under different environmental conditions.
Anim. Husb. 14

N. C. Development of a Breed of Sheep Adapted to Eastern North Carolina. To develop a light-faced hornless breed of sheep that will produce, in eastern North Carolina, marketable lambs of desirable quality by or before April 15, and have as much merit as possible in other important respects.
Anim. Indus. 33 (S-29)

Ohio Types of Sheep and Systems of Breeding for Market Lamb Production. To (1) determine productive value, range of adaptation, and breeding service use of F_1 Columbia x Merino ewes as a new eastern type of commercial ewe for grass-fat lamb production; (2) determine same for 3-breed-cross progeny from above ewes as commercial ewes; and (3) study possibility of three-breed rotation crossing and ascertain advantages and disadvantages of such a system of breeding in commercial sheep production.
Anim. Sci. 8

Oreg. Improvement of Sheep Through the Application of Breeding Methods.--2. Compare Progeny Testing with Inbreeding and Conversion of Lines as Methods of Sheep Improvement.--3. Comparison of Improvement That Can Be Made in a Closed Breeding Flock Compared with That in an Open Breeding Flock.--4. Inheritance of Characters of Economic Importance in Sheep. 2. To (a) develop superior lines of purebred sheep possessing sufficient homozygosity to stamp their characteristics on their offspring when used to improve sheep in breeders' hands; (b) compare relative efficiency of progeny testing and mild inbreeding with close inbreeding and converging of sub-lines at methods of improvement; (c) determine heritabilities of characters of economic importance; and (d) develop selection index with proper balance for mutton and wool characteristics considering relative economic importance and heritability of these characteristics. 3. To determine progress that can be made by selection for productive characteristics in closed flock as compared with progress made through selection in an open flock. 4. To determine inheritance of (a) black fibers; (b) fertility, particularly early vs. late lambing tendencies; (c) turned-in eyelids; (d) scurs; and (e) anatomical or physiological abnormalities of economic importance that may crop out.

Anim. Husb. 157-2, 3, 4

Tenn. Evaluation of the Adaptability of Existing Breeds and Commercial Types of Sheep for the Production of Early Milk Fat Lambs. To study (1) adaptability of existing breeds and commercial types of sheep for early fat lamb production under existing environmental conditions as measured by early lambing, prolificacy of ewe, milking ability, ram fertility, growth rate and carcass quality of lambs; (2) reproductive behavior with respect to start of estrus, regularity of cycles, repeatability of early cycling, and repeatability of early lambing; and (3) effect of exogenous hormones on reproductive behavior.

Anim. Husb., Vet. Sci. 70 (S-29) Coop. ARS

Tex. Comparison of Wool Production and Lamb Production by Fine-Wool Sheep of Different Strains or Breeding. To learn (1 and 2) wool production of sheep produced under project 404 as compared with Rambouillets of other sources; if crossing of 404 strain with non-related Rambouillets affects wool production. To compare (3 and 4) lamb production of 404 strain with Rambouillets of other sources; lamb production of offsprings of non-related Rambouillet ewes when crossed with 404 strain, with ewes not crossed with 404 strain.

Anim. Husb. 404

Tex. Breeding Fine-Fiber Mohair Goats. Transfer genes for fineness of fibers and genes for persistence of fineness to old age, which are present in many non-Angora goats, to Angoras.
Anim. Husb. 448

Tex. Development of Short-Tailed Domestic Sheep for Texas. To develop short-tailed sheep for use on Texas farms, sheep to be equal to or better than present adapted types with respect to wool and mutton.
Anim. Husb. 449

Tex. Improvement of Sheep through the Selection of Performance-Tested and Progeny-Tested Breeding Animals. To (1) obtain production records on young rams from different flocks and parts of State under uniform conditions for use in stud selection; (2) locate superior studs most prepotent for economically important characters; (3) study characteristics as to inheritance, relationship to each other and their relationship to productivity and value in commercial flocks; (4) compare breeding performance of tested to untested rams selected in usual manner when used on commercial flocks and compare progress to be made through use of 2 procedures; (5) range test with feedlot testing as measure of breeding value; and (6) develop and outline selection programs and procedures to bring about more rapid improvement in population.
Anim. Husb. 687

Utah Development of Open-Faced Rambouillet Sheep of High Productivity. To (1) develop open-faced Rambouillet sheep; (2) compare wool and lamb production of open-faced and closed-face Rambouillets maintained under similar environmental conditions; and (3) develop and make available for Utah sheep producers an improved strain of Rambouillet sheep.
Anim. Husb. 407

Va. Improvement of Sheep Through Recurrent Selection for Combining Ability. To investigate the effectiveness of the method of recurrent selection for combining ability as a means of developing lines of sheep within a pure breed with superior genetic merit for crossing with a particular type of commercial ewe as measured by the growth rate and carcass quality of the lambs.
Anim. Husb. 93905 (S-29) Coop. ARS

W. Va. The Relation of Birth Weight Within Breeds to Growth Rate of Purebred Mutton Type Lambs. To determine the relation of birth weight and rate of gain for several breeds.
Anim. Husb. 12

W. Va. Breed as a Factor in the Production of Ewes Retained for Flock Replacement and for the Production of Market Lambs and Wool. To compare wool and lamb production of western California ewes of Hampshire x Rambouillet and Suffolk x Rambouillet breeding, with wool and lamb production of their daughters sired by Corriedale, Dorset, and Hampshire purebred rams: (1) when dams and daughters are bred as ewe lambs to purebred Southdown rams; (2) when daughters are bred as yearling ewes and older to a ram of same breed as their sire: viz. Corriedale, Dorset, and Hampshire; (3) to obtain information on the selection, development, and mating of native ewe lambs intended for flock replacement; and (4) obtain data on production of market lambs and wool from native ewe lambs resulting from matings of California ewes and Corriedale, Dorset, and Hampshire rams that will permit proper comparison of these breeds when used as sires for production of breeding ewes and for production of market lambs and wool.

Anim. Husb. 23

Wyo. Improvement of Columbia and Corriedale Sheep by Selection, Linebreeding and Linecrossing. To (1) learn if diverse lines can be obtained by selection of lines for different traits; (2) learn effectiveness of selection for 1 or 2 traits in a small flock, and the incidental effects on other traits; (3) obtain further estimates of heritability of gain; and (4) make crosses between lines to obtain a maximum expression of heterosis as measured by combined lamb and wool production.

Anim. Prod. 517

Wyo. Breeding for Brown Leg Color in Columbia Sheep. To determine in a closed flock of Columbias: (1) the mode of inheritance of brown color; (2) the relation, if any, of brown color to economic traits; and (3) the extent to which brown color can be increased by selection.

Anim. Prod. 595

Wyo. The Performance of Purebred Wyoming Flocks. To (1) determine by objective measurements staple length, clean fleece weight, and body weight of mature ewes, yearling ewes, and rams of purebred flocks, also weanling weight of lambs and type score; and (2) formulate selection indexes and appropriate corrections for variable factors which influence performance of purebred Wyoming flocks, and through them commercial sheep.

Anim. Prod. 574

PHYSIOLOGY

General Physiology

Ariz. The Effects of Climatic and Nutritional Stresses on Growth and Productivity of Range Cattle. To (1) establish methods of accurately measuring individual animal heat tolerance and learn effect of high environmental temperatures on growth and development of beef cattle; and (2) learn effects of nutritional stress early in postnatal life on subsequent growth and lifetime production of range cattle.
Anim. Sci. 411 (W-46) Coop. ARS

Calif. Physiology of the Domestic Animals. To study the physiology of (1) reproduction; (2) ruminant stomach; and (3) the parathyroid gland as a control mechanism for the Ca level of the blood.
Anim. Husb. 941

Calif. Steroid Metabolism in Domestic Animals. Elucidation of fundamental aspects of steroid physiology in domestic animals, especially in ruminants. Development of rational therapeutic measures in endocrine dysfunction and/or other metabolic derangements manifested via altered steroid physiology.
Anim. Indus. 1659

Calif. The Effect of Nutrient Restriction on Growth and Body Composition of Sheep and Cattle. To (1) adopt routine use of antipyrine for learning body composition as a criteria in evaluation of stresses resulting from nutrient restrictions; (2) learn effect of different degrees of total energy, and protein starvation on over-all efficiency of production from sheep and cattle; and (3) develop methods of assessing feasible degree and length of nutrient restriction which is commensurate with economical production of range cattle and sheep.
Anim. Husb. 1722 (W-46) Coop. USDA

Colo. The Effect of Altitude on Growth and Production of Livestock. To (1) learn effects of constant and changing altitude on growth and production of livestock; and (2) devise methods for alleviating undesirable physiological responses produced by altitude effects on livestock.
Anim. and Dairy Indus. 238 (W-46)

Idaho Environmental Stresses Affecting Growth Patterns in Beef Cattle During the Embryonic Development and Subsequent Nursing. To (1) learn specific effect of environmental stresses on overall growth of embryo of cattle with emphasis on factors of space; and (2) establish rate of contribution of some of these environmental stresses on growth rate of calf and on specific organs and sections of the body between birth and weaning.
Anim. Husb. 309 (W-46)

Mich. Hormone Studies Related to the Physiology of Domestic Animals Including Investigations With Radioactive Isotopes. To (1) study mechanisms of thyroid function and variations in secretion rate of laboratory and domestic animals: learn optimum levels and combinations of hormones for inducing mammary growth and lactation; and (2) investigate gameto-kinetic factor in cattle feces with reference to its specificity for pregnancy diagnosis. (Goats and Chickens).
Vet. Med., Dairy, Anim. Husb. 25

Mich. The Thyroid Secretion Rate of Sheep as Affected by Seasons, Age, Breeds, Sex, Pregnancy and Lactation. To (1) make the following comparisons of thyroid activity: 3 breed comparisons, 1 sex comparison, 1 age comparison, 1 comparison between dry ewes and ewes in pregnancy and lactation, and seasonal variations; and (2) study effect of thyroid activity on semen quality in rams.
Anim. Husb. 91

Mich. Effects of Hormonal Imbalances on Nutritional Requirements. To determine the effects on specific dietary needs resulting from (1) administering large doses of cortisone, estrogens, androgens, thyroid-active substances, insulin and growth hormone; (2) removing adrenals, gonads, thyroids; or (3) from treatment with thiouracil or alloxan. It is hoped that these studies will further elucidate interactions between hormones and dietary factors in the body so that both may be used with greater efficacy and safety in the future. (Rats, Mice and Chickens).
Poul. Husb., Vet. Med. 105

Minn. The Effect of Maternal Nutrition on Development, Growth and Performance of the Young. Small laboratory animals will be used for initial studies. Dietary restrictions of mothers in caloric, protein, mineral and vitamin intake, as well as production of acute temporary vitamin deficiencies by means of vitamin analogues, will be used as experimental techniques. The young will be studied with respect to birth weight, anatomical malformations, vitamin content of tissues, viability, growth, and development. Similar observations will be made with animals fed the best diets that can be devised. Chemical studies will be made on the blood and tissues of mothers and young to study relation between maternal and fetal composition under various conditions. With young born to mothers on restricted diets, a study will be made on the effect of optimum vs. suboptimum nutrition on growth and performance. This may indicate whether deleterious effects of prenatal nutrition can be corrected later.
Biochem. 1514

Minn. Neuroanatomical Investigations in Domestic Animals.--1. Neuroanatomical Studies of Rumination in Domestic Animals.--2. Experimental Investigation of Horner's Syndrome in the Horse. To (1) investigate central nervous system of domestic animals by established procedure; and (2) evaluate results of above and use information to solve problems of diagnosis and treatment of disorders of nervous system.
Vet. Surg. and Radiol., Vet. Physiol. Pharmacol. 2618

Minn. Studies of Adrenal Glands of Ruminants. To (1) work out satisfactory technique for morphological and biochemical studies of adrenal medulla; and (2) apply techniques in correlated histological, histochemical, and biochemical studies of adrenal medullae of ruminants, from animals under conditions of rest and stress.
Vet. Med. 2628

Nev. The Effect of Water Intake on Growth and Production of Range Livestock. To study (1) effect of mineralized water on growth and feed utilization of range livestock; and (2) effect of water privation on growth and feed utilization of range livestock.
Anim. Husb. 40 (W-46) Coop. ARS

N. Mex. Effect of Nutrient Restriction on Adaptability of Cattle to the Semi-Arid Ranges of the Southwest. To learn the effect of (1) nutrient restriction, following weaning, on growth of heifers; and (2) altered growth due to nutrient restriction in early life on lifetime production.
Anim. Husb. 81 (W-46) Coop. ARS

Oreg. Relationship of Cardiovascular Activity to Environmental Stresses in Cattle and Sheep. To (1) learn nature of cardiac adjustments, under normal and stress conditions, and study cardiac activity as an index of stress; and (2) study mechanisms of alterations in cardiac activity in beef cattle and sheep.
Anim. Husb. 278 (W-46) Coop. ARS

Pa. The Nature of the Forssman Hapten. To (1) simplify isolation purification procedures for Forssman hapten from erythrocytes of sheep; (2) identify components making up this hapten; (3) learn manner in which components are combined; and (4) study mechanism of the reaction of purified Forssman hapten with specific antibody.
Agr. and Biol. Chem. 1305

Tenn. The Effects of Certain Atmospheric Effluents Upon the Growth and Composition of Plants, and Upon Animal Life, at Locales in East and Central Tennessee. To ascertain the verity of numerous contentions that the harmful effect upon growth and composition of crops and the severe effects upon livestock in certain locales are attributable to effluents released from nearby manufacturing operation; to establish the causal factors for any such determined effects; and to propose remedial measures and to demonstrate their efficacy.

Agron. 50 Coop. TVA

Utah Interralations of Climate and Nutritional Stress on Growth and Production of Range Sheep and Cattle. To (1) evaluate and develop more efficient methods of estimating the physiological well-being of range sheep and cattle; and (2) learn effect of nutritive levels on their growth and reproduction when maintained under stresses of climate.

Anim. Husb. 488 (W-46)

Va. Volatile Fatty Acid Metabolism and Glycogen Storage as Related to Age and Dietary Changes. To learn (1) extent of differences of volatile fatty acid absorption by rumen as related to age, development, and associated dietary changes; and (2) if differences in ability of liver to handle volatile fatty acid as related to age.

Biol., Biochem. and Nutr. 86092

Reproduction and Lactation

Fla. Production of Early Spring Lambs in Florida. To learn effects of breeding, shearing of ewes prior to breeding season, night mating and selection for early lambing as means of producing an early spring lamb crop.
Anim. Husb. and Nutr. 740 (S-29)

Ga. The Effect of Plane of Nutrition on the Fertility of Sheep Under Georgia Conditions for Early Spring Lamb Production. To study effects of 3 planes of nutrition during prebreeding and breeding season on breeding performance of sheep.
Anim. Indus. 54 (S-29)

Ga. The Use of Hormones in the Control of Estrus and Ovulation In Breeding Ewes. To study effectiveness of variations in combined use of progesterone and pregnant mare serum (PMS) in inducing extra-seasonal breeding in ewes by studying effects of variation in: interval between final progesterone injection and PMS; duration and level of progesterone treatment; and number of PMS injections.
Anim. Husb. 319 (S-29) Coop. USDA

Ill. Physiology of Reproduction of Sheep. To (1) study normal variability in reproductive pattern of sheep; (2) measure and compare hormonal and ovarian changes during anestrous and estrous periods; and (3) determine effect of hormones on reproductive performance of anestrous sheep.
Anim. Sci. 20-375

Ill. Physiology of Mammalian Germ Cells as Related to Embryonal Mortality. To (1) learn effects of aging germ cells, in vivo and in vitro, on embryonal mortality and subsequent development; and (2) determine effect of various storage media and of temperature on viability of germ cells.
Anim. Sci. 20-383

Ind. The Influence of Light and Temperature on the Breeding Season of Sheep. To (1) determine effects of light and temperature on estrus, ovulation, fertilization and pregnancy in sheep; and (2) observe other physiological effects of alteration of environment.
Anim. Husb., Agr. Engin. 728

Kans. Use of Management Techniques and Hormones in Ewes for Controlling the Time, Rate, and Regularity of Lambing. To learn effect of environmental and genetic influences upon time, rate, and regularity of lambing, and management methods which will improve lambing performance of ewes.
Anim. Husb. 441

Ky. Improving Conception in Kentucky Purebred, and In Commercial Ewes. To (1) increase conception rate in both purebred and commercial ewes; (2) advance conception dates, especially in purebred ewes; (3) reduce duration of lambing period; and (4) increase incidence of multiple births, especially in commercial ewes.
Anim. Indus. 254

Mich. The Thyroid Secretion Rate of Sheep as Affected by Seasons, Age, Breed, Sex, Pregnancy, and Lactation. To (1) make the following comparisons of thyroid activity: 3 breed comparisons, 1 sex comparison, 1 age comparison, 1 comparison between dry ewes and ewes in pregnancy and lactation, and seasonal variations; and (2) study effect of thyroid activity on semen quality in rams.
Anim. Husb., Agr. Chem. 91

Mich. A Study of the Effect of Hormones Upon Bacteria Found in the Reproductive Tract of Certain Farm Animals. To determine (1) physiological effect *in vitro* of gonadal hormones upon pathogens isolated from reproductive tract; and (2) same effects *in vivo* of these hormones upon selected infected animals.
Vet. Med. 109

Minn. Studies on Physiological Factors Affecting the Degree of Fertility and Methods of Increasing Breeding Efficiency in Livestock. To (1) learn cause of low fertility in sires and provide methods of increasing and maintaining fertility, uncover more basic information related to normal reproductive processes in the male, study use of supplementary endocrines in male and their effects on reproductive processes; and (2) complete studies on physiology of fetus in utero, in order to establish the normal fetal-maternal relation giving rise to live birth, establish procedures where experimentation can be applied on fetus without harm, learn factors affecting impairment of fetus' normal development and causing death, develop ways of reducing incidence of prenatal mortality under present circumstances.
Anim. Husb. 1424

Miss. A Study of the Factors Affecting Date of Lambing. To determine (1) the importance and causes of anestrus and develop methods to terminate this condition in a way that a successful pregnancy can be initiated; (2) reproductive performance of the ewe following the period of anestrus; and (3) reproductive performance of the ram as based on semen quality, and ability to settle ewes.
Anim. Husb. HE-5 RRF-2 (S-29)

Mo. Biochemical, Physical, and Physiological Aspects in Natural and Artificial Breeding. To (1) make a thorough study of the chemistry and/or biochemistry of male and female germ cells in order to gain knowledge which is needed as a basis for future investigations involving: (a) ova and spermatozoa storage and preservation, (b) artificial insemination, (c) ova transfer, (d) fertilization mechanism, and (e) chemistry and physiology of gene action; (2) investigate the enzyme systems and metabolic activities of male and female gametes, the results of these studies being basic requirements for further work on storage media, cold shock phenomenon of spermatozoa, low temperature storage of ova and spermatozoa, and possibly to other reproductive processes or activities affecting fertility and litter size; (3) characterize and isolate certain factors present in egg yolk, boiled milk, chick embryos, and other biological tissues that aid in preservation of the viability of spermatozoa of farm animals and protect them against a number of adverse environmental conditions inculding sudden lowering of temperature; and (4) make further investigations into the physical requirements of male and female germ cells.
Anim. Husb. 81

Mo. Estrus, Ovulation, Nidation, Embryonic Deaths and Related Phenomena in the Female Spermatogenesis and Related Physiological Functions in the Male. To study the fundamental anatomy and physiology of the reproductive organs of farm animals with special emphasis, at present, on the litter bearing animal, swine.
Anim. Husb. 222

Mont. Environmental Factors Affecting Ovulation, Fertilization and Reproduction Rate of Range Ewes. To learn effects of varied management methods under observed climatic conditions during prebreeding and post-breeding and interactions thereof on: ovulation rate; fertilization rate; birth rate; and embryonic mortality.
Anim. Indus. and Range Mgt. 1012 (W-46) Coop. ARS

Ohio Influence of Ladino Clover and Birdsfoot Trefoil Pasture on Reproductive Efficiency in Sheep. To (1) compare Birdsfoot Trefoil and Ladino Clover as principal legume for permanent sheep pasture; and (2) determine effect of the two legumes on gain efficiency, animal health, and reproductive efficiency.
Vet. Sci., Anim. Sci. 34-7

S. C. Some Factors Affecting Breeding Performance and Early Lambing in Sheep. To determine effect of various factors on breeding performance and early lamb production including selection, hormones, light, temperature, light and temperature.
Anim. Husb., Dairy Husb., Agr. Engin. 69 (S-29) Coop. USDA

Tenn. The Effect of Radiation on Reproductive Physiology in Farm Animals. To evaluate effects of acute and chronic irradiation on reproductive physiology and growth in farm animals on (1) semen characteristics; (2) potential fertility in the male; (3) estrual cycle phenomena in the female; (4) potential fertility in female; (5) endocrine system; and (6) growth of young animals.
Anim. Husb. 66 Coop. ARS

Tex. A Study of the Maturation Process in the Ova of Mammals. To (1) determine normal maturation process of egg nucleus in cow, ewe, sow, mare, and mule; (2) ascertain maturation response of egg nucleus during induced ovulation in both the follicular and luteal phase of the cycle; and (3) obtain data for cause of infertility of mammalian eggs.
Anim. Husb. 854

Wis. Reproduction Studies with Sheep. To (1) learn for early breeding season phases of reproductive process where failure may occur; (2) identify cause of this failure in terms of genetic stock, nutritional, management or disease state of animal; (3) develop research to correct findings of above; and (4) learn influence of reproductive hormones on growth and interrelations of growth and fattening with reproductive performance.
Anim. Husb. 959

Wyo. The Effects of Nutritional Stresses on Growth and Productivity of Range Sheep. To (1) study physiological response of bred ewes to feed and water restriction, and their recovery from stresses; and (2) compare accuracy and economy of conventional measurement methodology with isotopic body composition determinations.
Anim. Prod. 647 (W-46)

Rumen Function and Bloat

Ark. The Influence of Quality of Roughage on Rumen Digestion. Learn influence of quality of roughage on rumen digestion; use information as a basis for formulating more efficient rations for dairy cattle.
Anim. Indus., Vet. Sci. 331

Calif. Studies on Bloat in Ruminants. Study basic factors influencing formation and elimination of ruminal gas in cattle and sheep.
Anim. Husb. 1703, Coop. ARS

Ill. Studies on Protein and Carbohydrate Metabolism in Ruminants, Especially as Affected by Rumen Microorganisms. Increase efficiencies in those metabolic processes of rumen microorganisms by which nutritional demands of ruminants may be satisfied.
Dairy Sci. 35-315

Ind. Biochemical Aspects of Ruminant Bloat. To learn (1) constituents of feeds and forages that increase bloat, (2) biochemical compounds and reactions involved in bloat.
Biochem., Agron., Vet. Sci., 828 (NC-27)

Iowa Increasing the Usefulness of Forage Crops and High-Cellulose Roughages by Improved Rumen Function (ZYMO-Chemistry) in Beef Cattle and Sheep. To (1) increase usefulness of forage crops and high-cellulose roughages through improved rumen function or improved bacterial digestion within rumen of beef cattle and sheep; and (2) work for better nutrition in cattle and sheep resulting from improved rumen function especially in those animals subsisting largely upon low-grade roughages and forages.
Anim. Husb., Chem., SBS 1208

Iowa Physical and Chemical Aspects of Bloat. To (1) study effect of dietary components and therapeutic agents on physical and chemical characteristics of rumen ingesta; (2) learn relation of dietary characteristics to incidence of bloat; (3) learn various physical and chemical characteristics of rumen ingesta and of blood and other tissues from bloated animals; (4) learn efficacy of prophylactic procedures and therapeutic agents; and (5) learn relation of physical characteristics of animal to incidence of bloat.
Anim. and Dairy Husb., Chem., Vet. Med. 1267 (NC-27)

Iowa — Cellulose Digestion by Pure Cultures of Rumen Microorganisms. Isolate and characterize (1) rumen microorganisms which are active cellulose digesters; (2) cellulose dextrins and oligosaccharides and products formed from them by enzymes or pure cultures of rumen microorganisms. Study (3) by means of artificial rumen technique, the availability of isolated cellulose breakdown products to mixed cultures of rumen microorganisms in predicting usefulness of these products in cattle and sheep rations; (4) potential utility of cellulolytic enzyme preparations as feed additives or as solubilizing agents for coarse roughages prior to feeding.

Anim. Husb., Chem. 1357 (NC-25)

Kans. — A Study of the Intermediary Metabolism of Rumen Micro-Organisms with Reference to the Formation of End Products from the Carbohydrates of Roughage. Elucidate mechanisms in formation of end products, as fatty acids, from the carbohydrates of roughage. Study inter-relationship of apparently nonuseful end product methane with production of useful carbonaceous end products. Isolate enzyme systems capable of carrying on one step reactions found in carbohydrate fermentation.

Bact., Dairy Husb. 425 (NC-25)

Kans. — Interrelationships of Feedstuffs Combinations, Appetite, Rumen Function, Digestibility, and Rumen Microorganism in Roughage Utilization. To learn (1) interrelationships of feedstuffs combinations, appetite, rumen function, digestibility, and rumen microorganisms so as to explain differences among animals in their ability to utilize roughage, (2) parts played by rumen microorganisms and combinations of feedstuffs in efficiency of roughage utilization.

Dairy Husb. 455

Mich. — The Use of Nitrogenous Materials in Ruminant Nutrition. To (1) determine optimum protein levels needed to obtain maximum use of roughages; (2) determine extent to which urea or other simple N sources can be used in place of natural protein; and (3) establish role of other nutrients such as trace minerals and organic growth promoting factors required to produce maximum digestion of cellulose and other rather indigestible components of feeds.

Anim. Husb. 118

Mich. Investigations of the Causes and Methods of Control of Frothy Bloat. To learn (1) chemical and physical properties of saliva, (2) relationship of saliva and its components to frothy bloat, (3) effect of rations on amount of froth produced, (4) role of microorganisms in production and stabilization of froth in rumen.
Dairy 812 (NC-27)

Minn. Bloat Producing Mechanisms in Ruminants. To (1) clarify poorly understood motor control mechanisms in the ruminant stomach, especially the forestomachs, (2) develop a bioassay procedure for toxic, bloat-producing legume extracts.
Anim. Husb., Dairy Husb., Vet. Med. 2624 (NC-27)

Mo. Rumen Culture. To (1) set up in lab an artificial rumen with conditions simulating those found in natural rumen; (2) study by quantitative chemical analysis the changes that occur in a ration as it is fermented in artificial rumen; (3) study methods of preserving rumen organisms so they will be available for inoculation of artificial rumen; and (4) study effects of these preserved rumen microorganisms on a ruminant.
Agr. Chem. 152 Coop. USDA

Mo. Ruminant Digestion.--a. Development and Testing of Techniques for the Study of Ruminant Digestion. To develop surgical, chemical, and bacteriological techniques which can be routinely applied to the study of ruminant digestion.
Anim. Husb., Chem., Vet. Med. 168-a

Mo. Ruminant Digestion.--b. Chemical Compounds Which Affect the Digestion of Roughages by Ruminants. To determine (1) effect of food nutrients, antibiotics and other chemicals on rumen flora and fauna; and (2) optimum level and source of soluable carbohydrates for maximum cellulose use in sheep.
Anim. Husb., Agr. Chem. 168-b

Nebr. Rumen Biochemistry and Nutrition: The Digestion and Degradation of Feed Protein in the Rumen. To learn (1) occurrence of protein splitting reactions, extent thereof, and importance and effect of various factors on protein digestion, (2) nature of reactions which degrade N compounds within rumen, extent of such breakdown particularly to ammonia, and effect of various factors on degradation.
Biochem. and Nutr. 514

Nev. Isolation and Determination of Bloat Producing Saponins in Nevada Forage. (1) Secure composite samples of saponins and sapogenins from Western Utilization Research Branch and separate or isolate saponins and sapogenins. (2) Develop a better strain for identification by chromatography or electrophoresis. (3) Quantitatively learn saponins or sapogenins present.
Agr. Chem. 37

N. Dak. Rumen Microbiology in Sheep and Cattle. (1) Identify species of microbes that populate rumen in sheep and cattle under various nutritional conditions. (2) Evaluate effect of various growth factors and antibiotics on efficiency of utilization of high and low quality roughages in an artificial rumen.
Anim. Husb., Bact. 8-4 (NC-25)

Ohio Digestion Studies.--7. Factors Affecting the Utilization of Feeds by Ruminants. To (1) learn factors affecting roughage digestion in ruminants, using an artificial rumen technique; (2) learn by in vitro methods factors in non-protein N utilization by rumen microorganisms; and (3) apply and further learn factors important in rumen function, using cattle experiments directed toward greater efficiency of utilization of low grade roughages.
Anim. Sci. 33

Ohio Bloat in Ruminants. 1. Causes. To investigate causes of bloat based on clinical observations, examination of rumen samples for hydroscopic properties, volatile fatty acid content and microorganism variations and examination of blood concentrations of nitrogenous constituents.
Vet. Sci., Dairy Sci. 123 (NC-27)

Pa. A Study of the Effect of Ration Components on the Metabolism of Rumen Microorganisms. (1) Compare crude fiber digestibilities in vitro with crude fiber digestibilities determined by conventional digestion trials. (2) Study depressing effect of high levels of soluble carbohydrate on the rate of cellulose digestion by rumen microorganisms in vitro. (3) Identify unknown growth factors for rumen microorganisms that increase rate of cellulose digestion and protein synthesis in vitro. (4) Study mode of action of newly discovered growth factors for rumen microorganisms.
Anim. Nutr. 1304

S. Dak. Bloat in Ruminants. To (1) learn through physiological investigations cause and mechanism of death in bloat; (2) learn biochemical differences in bloat-producing and non-bloat-producing feeds and in rumen contents of bloated and normal animals; (3) ascertain bloat-producing potential of tetraploid and diploid forms in both yellow- and blue flowered species of alfalfa.
Dairy Husb. 245-R (NC-27)

Va. The Isolation, Propagation, and Nutrition Requirements of Cellulose-Decomposing Bacteria Found in the Rumen of Cattle That are Consuming High-Roughage Feeds. To (1) isolate cellulose-decomposing bacteria from rumen of cattle and design methods for propagation in quantity; and (2) investigate nutritional requirements of cellulose-decomposing bacteria as to carbon, N, minerals, and unidentified growth factors.
Biochem. and Nutr., Anim. Path., Anim. Husb. 86045

Va. The Effect of Various Protein and Non-Protein Nitrogen Sources on Protein Assimilation by Rumen Microorganisms. To (1) learn if non-protein N of types used in cattle feeds suppresses decomposition of feed protein by rumen microorganisms; and (2) compare proteins of forage crop stems and leaves, seed proteins, and animal proteins of high biological values of N sources in protein synthesis by rumen microorganisms.
Biochem. & Nutr., Anim. Husb., Dairy Sci., Biol. 86046

Va. The Metabolism of the Major Products of Rumen Fermentation and Gastro-Intestinal Digestion by Tissues from Ruminant Animals. (1) Study relative use of low molecular weight fatty acids and factors affecting their use by ruminant tissue preparations. Learn (2) principal route by which propionate is metabolized by ruminant and nonruminant tissue preparations; (3) effect of age and species differences on ability of tissues to metabolize low molecular weight fatty acids.
Biochem. and Nutr., Anim. Path., Dairy Sci. 86098

NUTRITION

General Nutrition

Fla. The Nutritional Availability of Components of Livestock Feedstuffs. Obtain quantitative evaluation of digestibility, absorption and metabolic utilization of livestock feedstuffs which are readily available but not generally used.
Anim. Husb. & Nutr. 755

Fla. The Nutritive Value and Storage Characteristics of Cobalt-60 Irradiated Foods and Feeds. Develop techniques for maintaining the nutritive value and palatability and extending storage period of foods and feeds preserved by irradiation with Co-60 at pasturization and sterilization levels.
Anim. Husb. & Nutr., Food Tech. & Nutr. 849

Hawaii Studies to Determine the Nutritive Value and Metabolism of Products and By-Products of Hawaiian Industry. Seek information relative to value of products and by-products of Hawaiian agriculture and industry for livestock feeding with major emphasis on use of molasses, sugar cane bagassee and pineapple by-products by chemical analysis of feeds to be used; learn digestibility; feeding trials to assess production response accompanied by: studies of nutrient absorption, nutrient and metabolite levels in blood and urine, metabolism and its relation to requirements for specific nutrients.
Anim. Husb. 269

Ill. Nutritional Aspects of Aging in Animals. (1) Evaluate impact of aging in animals on requirements for, and metabolism of, certain nutrients. (2) Learn effect of age in rat upon following processes: intestinal absorption of thiamine-C^{14}, cyanocobalamin-Co^{60}, Ca^{45}; synthesis of the coenzyme forms of thiamine; occurrence of "bound" and "diffusible" Ca in muscle and liver; uptake of Ca by the bones; digestibility of protein N.
Anim. Sci. 20-357

Ill. Carbohydrate Metabolism of Ruminants. Employ red cells of ruminants as a model system in a study of the metabolism of their tissues.
Dairy Sci. 35-323 (NC-25)

Kans. The Relationship of Physical Balance and Energy Value in Sheep Rations. Measure lamb response to pelleted and unpelleted rations of varying concentrations and learn comparative digestibility of such rations.
Anim. Husb., Chem. 236

Mo. The Effect of Ration Physical Form on Ruminant Digestion and Feed Utilization. To learn effect of ration physical form on its digestion and metabolism by ruminants.
Anim. Husb. 250 (NC-25)

Mont. Nutritional Requirements of Ewes Wintered Under Range Conditions. I. Protein Requirements. To (1) determine effect on ewe weights, lamb production, and wool production of supplemental winter feeding of concentrates with various levels of protein, (2) develop reliable range sampling techniques to permit determination of chemical composition of forage consumed by sheep, (3) perfect methods to reliably determine total amount of forage consumed by grazing sheep, (4) study blood protein level and its relationship to state of protein nutrition, and (5) compare milk production of ewes on different levels of protein.
Anim. Indus., Range Mgt., Vet. MS-846

N. Y. (Cornell) The Nutritional Requirements of Herbivora as Studied by Purified Diet Methods. To determine the nature of the deficiency in purified diets and devise a diet of purified ingredients that will sustain satisfactory growth, reproduction, and lactation in herbivorous animals.
Anim. Husb. 59

Pa. Influence of Soils and Fertilizers on the Composition and Nutritive Values of Foods and Feeds. To study influence of nutritive conditions of plant growth on composition and nutritive values of agricultural products.
Agron., Anim. Nutr., Dairy, Hort. 1019

Wyo. Nutritional Evaluation of Wyoming Feeds. To (1) learn coeffecients of digestibility of proximate principles of Wyoming feeds, (2) learn N, Ca, and P balance when various Wyoming feeds are fed to ruminants, (3) compare "grab" sampling techniques utilizing indicators to conventional total collection technics for determining digestibility, (4) learn digestion coefficients of proximate principles by bulls, heifers, rams and ewes on performance testing using "grab" sampling techniques, (5) correlate feed-lot performance with digestion coefficients of proximate principles.
Anim. Indus. 566

Pasture and Forage

Ala. Investigations of the Changes in Chemical and Physical Properties of Pasture Herbage That Influence Their Utilization and Nutritive Value of Grazing Animals. To (1) determine with grazing animals seasonal distribution of digestible nutrients furnished by various forages adapted to several soil types and climate of Alabama; (2) study seasonal changes in physical and chemical properties of pasture plants and relation of these to palatability and nutritive value; (3) devise grazing management practices to promote continued optimum animal production from established swards.

Anim. Husb. and Nutr. 423

Ariz. The Evaluation and Utilization of Low Quality Roughages as Feeds for Livestock in Arizona. To evaluate by chemical analyses, digestibility trials, and palatability studies, roughages and by-product feeds present in Arizona and which possess nutrient deficiencies and palatability limitations. Learn effective and economical methods for efficient utilization of these low quality roughages.

Anim. Sci. 388, Coop. ARS

Ark. The Evaluation of Forage and Other Nutrients for Sheep. To (1) evaluate forage commonly available for sheep production in South on which adequate experimental information is lacking, (2) study effects of certain micro-nutrients on utilization of forage materials, (3) study influence of certain nitrogen concentrates on efficiency of roughage utilization by sheep.

Anim. Indus., Vet. Sci. 400

Calif. Fiber and Fibrous Feeds in Nutrition. To (1) study utilization of isolated fiber (cellulose, hemicellulose, lignin and combinations) and fibrous feeds, by rats, pigs, cattle and sheep thru use of ad libitum and paired feedings, N balance, and digestibility; (2) make chemical studies on methods of analysis and isolation of fibers; and (3) apply findings to the utilization of forage.

Anim. Husb. 1569

Calif. Nutritive Value of Specific Range Forage Species as Influenced by Seasons, Fertilization and Management. To learn (1) techniques for measuring consumption, a. esophogostomy, b. clipping, c. hand selection, d. reference substances-lignin, chromic oxide, chromogens, (2) nutritive value of specific range species, a. chemical composition, b. digestibility, c. mineral availability, d. fiber utilization.

Anim. Husb., Agron. 1670 (W-34) Coop. FS

Colo. An Investigation of Unidentified Nutritional Factors in Alfalfa and Certain Range Plants. To (1) study and identify unidentified nutritional factors in alfalfa and various browse types indigenous to Colo. range-land, which are known to enhance the over-all value of rations to which they are added; (2) determine manner in which such substances as stated above, act to supplement or improve rations in which they are included; and (3) determine optimum levels of supplementation of above mentioned factors.
Anim. Indus. 176

Colo. The Value of Native and Seeded Range Grasses and Supplementation Required in the Nutrition of Beef Cattle. To learn (1) nutritive value of native and seeded range grasses grazed in rotational pattern, (2) chemical analysis of seasonal changes in nutrient content of native and seeded range plants, (3) losses from range cover to rodents, insects, weathering, and cattle trampling, (4) effect on beef production of protein supplementation regulated to balance seasonal nutrient variation in range grasses.
Anim. Indus. 229 (W-34)

Del. Nutritive Evaluation of Forages. To determine (1) yield of digestible nutrients of forage crops cut at various stages of maturity and produced under different management procedures, (2) yield of digestible nutrients when various forages are grazed or when various systems of grazing are used, (3) if the rabbit can be used to test the digestibility of forages which are produced to be consumed by other species.
Anim. and Poultry Indus. 42-AI (NE-24)

Hawaii Range Beef Cattle Nutrition Studies in High Rainfall Areas. (1) Obtain information on nutritive value of forages produced in humid rangeland areas on which better beef production and range management practices may be based. (2) Learn factors governing grazing value of humid rangeland on: native forages, native and introduced forage species, improved forage species. Learn: (3) need for supplemental feeding of range cattle under above conditions; (4) effect of range fertilization and land preparation on nutritive value of selected forages.
Anim. Sci., Agron. and Soil Sci. 261 (W-34)

Idaho Beef Cattle Nutrition on Seeded and Native Forage in Idaho. To learn nutrient content, total digestible nutrients, and digestible energy of forage consumed by cattle when grazing at different intensities and seasons of use on: seeded areas and native forage, (2) learn effect of intensity of grazing on nutrient intake and livestock production, (3) learn need for and value of various nutritional supplements for cattle subjected to above grazing treatments, (4) apply nutritional results obtained to better beef cattle production and range management practices.
Anim. Husb. 296 (W-34) Coop. FS; USDI--Bur. of Land Mgt.

Ill. Silage Made from Component Parts and the Whole of Various Plants. Study: (1) contribution which component parts and combinations of parts of various plants can make to rations of beef cattle and sheep; (2) problems of preservation associated with making various parts into silage; (3) types of storage suitable for different silages. (4) Correlate various silages with various beef cattle and sheep-feeding programs.
Dixon Spr. 40-338

Kans. Nutritive Value of Forages as Affected by Soil and Climatic Differences. To study (1) differences in nutritive value of forages as affected by variations in fertility and other characteristics of soils, and (2) effects of climatic factors.
Anim. Husb. 430

Ky. A Comparison of Various Grass Silages as Roughages for Pregnant Ewes. To determine relative merits of grass silages from Kentucky 31 Fescue and from a mixture of Kentucky 31 Fescue and Ladino clover.
Anim. Indus. 253

Ky. Factors Influencing Low Quality Roughage Digestion in Sheep. To determine effect of adding the following substances to rations of low quality roughages in promoting maximum roughage digestion in sheep: nitrogen, readily available carbohydrates, inorganic materials, and other factors.
Anim. Husb. 257

Ky. Comparison and Evaluation of Several Techniques for Measuring the Nutritive Value and Palatability of Pasture Forage for Ruminants. To compare, evaluate, and further perfect the following indicators for learning digestibility and consumption of pasture forage by ruminants; lignin, chromium oxide, fecal nitrogen and forage nitrogen.
Anim. Husb. 1004 (S-12)

Maine Nutritive Evaluation of Timothy Hay Grown with Various Levels of Nitrogen Fertilization. Learn (1) digestible energy and digestible protein content of 1st cutting timothy hay grown under various levels of N fertilization and harvested at full-head stage; (2) total protein, ether extract, ash and fiber content of these same hays; (3) lignin and cellulose content of these hays and study relation between these values and digestible energy values; (4) apparent digestibility of crude fiber fraction of hays.
Chem., Anim. Indus., Agron. 114 (NE-24)

Mich. The Chemical Determination of the Carbohydrate Fraction in Various Forage Crops and Their Isolation and Identification. (1) Investigate suitability of existing chemical methods for learning various carbohydrates in forage crops and devise new methods whenever necessary, (2) Make systematic chemical study of carbohydrates in forage crops consumed by ruminants. (3) Investigate environmental conditions influencing composition of forages. (4) Make digestion trials on forages when feasible.
Agr. Chem., Dairy Indus., Plant Physiol. 811 (NC-25)

Miss. A Study of the Cause and Prevention of Grass Tetany in Lactating Ewes Grazing Cereal Forages. To (1) attempt to identify causative agent(s) in grass tetany; and (2) study incidence of grass tetany in ewes grazing oats, ryegrass and wheat, and study of practical methods of preventing grass tetany.
Anim. Husb. HE-2

Miss. The Effect of Ovarian Hormones on Rate of Gain and Fleece Weight of Wether Lambs Grazed on Winter Pasture. (1) Learn effect of stilbestrol and progesterone plus estradiol implants on rate of gain of lambs grazed on winter grazing crops. (2) Compare weight gains made by lambs treated as above on different winter grazing crops. (3) Observe any undesirable side effects from using hormones. (4) Learn effect of stilbesterol and progesterone plus estradiol implants on fleece weight.
Anim. Husb. HE-18

Miss. Management Studies on Finishing Feeder Lambs in the Mississippi Delta. Compare (1) dry lot feeding and early pasture crops as methods of maintaining lambs until winter pasture is available; (2) gains and value of lambs finished on winter pasture on sandy loam and clay soils.
Livestock P & F HU-4

Mo. Roughage and Pasture in the Production of Late Lambs. To (1) produce choice market lambs without use of concentrates for ewes or lambs, (2) learn nutrient production and sheep carrying capacities of major Mo. pasture crops in each season, (3) recommend suitable forage mixtures for a year round pasture program for sheep production, and (4) estimate nutrient requirements of pregnant ewes under farm flock conditions in Missouri.
Anim. Husb. 142

Mo. The Effect of Nitrate in Feedstuffs on the Performance of Sheep and Cattle. To (1) observe effect of feeding forages, grown under conditions which favor high nitrate accumulation, on the rumen function and general performance of sheep and cattle, and (2) learn if effects observed in (1) can be duplicated by adding nitrate to the normal ration of cattle and sheep.
Anim. Husb. 251

Nebr. The Mechanism of Digestion of Polysaccharides from Roughages by Microorganisms of the Rumen. Identification of products of digestion of polysaccharides from roughages by bacteria from rumen. Investigation of mechanism of utilization of degradation products of polysaccharides.
Biochem. and Nutr. 491 (NC-25)

Nev. The Nutritive Value of Range Forage and Its Relationship to Reproduction and Growth of Range Livestock as Modified by Nutrient Supplementation. Learn botanical and chemical composition of diet of range livestock as modified by location, season, climate, and management practices with special reference to nutrient deficiencies. Learn effects of seasonal supplementation upon growth, reproduction, blood and body composition during both period of supplementations and subsequent periods in terms of nutrient requirements under range conditions. Study use of range forages as determined by growth, digestibility, metabolism, and body composition studies. Develop techniques for study.
Anim. Husb. 8 (W-34) Coop. ARS

N. J. Relationship of Time of Cutting to Digestibility of Hay From Alfalfa and Birdsfoot Trefoil. To determine the digestibility of (1) alfalfa hay cut during the 1/10, 1/2 and full bloom stages; and (2) Birdsfoot Trefoil hay during the 1/10, 1/2 and full bloom stages.
Anim. Husb., Farm Crops 90 (NE-24)

N. Mex. The Effect of Various Purified Food Ingredients in Ruminants. Learn the influence of various food supplements on digestibility of a native range hay with sheep.
Anim. Husb. 3

N. Mex. Economic Evaluation of Crested Wheatgrass for Grazing Ewes and Lambs in North-Central New Mexico. Learn (1) physical productivity of ewes and lambs grazed on crested wheatgrass in spring in comparison with native sagebrush range; (2) economic effect of grazing wheatgrass at varying intensity on ewe and lamb gains; (3) economic benefit to be derived from spring grazing on wheatgrass vs. native range.
Agr. Econ. 71 (W-16) Coop. FS

N.Y. (Cornell) Maximum Utilization of Forages by Livestock. To study (1) effects of methods of harvesting and storing on nutrient losses and chemical composition of forages; (2) effects of time of cutting on chemical composition and digestibility of forages for various classes of livestock; (3) by comparing the quality and feeding value of forages cut at different stages of growth and handled by different methods for feeding various classes of livestock, especially dairy and beef animals; (4) value of pastures with and without supplemental feed at various times during grazing season; (5) effects of high quality forage in reducing need for concentrates.

Anim. Husb., Agron., Agr. Engin. 195 (NE-24)

N. C. Biochemical Factors That Affect the Apparent Nutritional Qualities of Forages. (1) Identify and biologically characterize organic compounds in forages having a physiological action. (2) Identify factors in forages causing differences in animal responses associated with digestibility of feed consumed.

Anim. Indus. H-35

N. C. Factors Affecting Cellulose Digestion by Ruminants. Study *in vivo* and *in vitro* factors affecting: (1) potential cellulolytic activity in rumen; (2) ratios and rate of formation of end-products of cellulose degradation.

Anim. Indus. H-153

N. Dak. Roughage Utilization by Ruminants. (1) Study the "time factor" in roughage utilization by cattle and sheep. (2) Compare the abilities of cattle and sheep to utilize good and poor roughages. (3) Investigate effect of different feed supplements, as dried rumen preparations, antibiotics, hormones and other factors on roughage digestibility and utilization by the ruminants.

Anim. Husb. and Vet. Sci. 7-2

Ohio Improvement of the Method for Determining the Crude Fiber and Nitrogen-free Extract (N.F.E.) of Feeds. To improve crude fiber method of analysis so that the crude fiber determination will be a measure of the fraction of the feed that is the undigestible carbohydrate fraction and the N.F.E. (by difference) is the readily digestible fraction.

Anim. Sci. 5

Ohio — The In Vitro Digestibility of Cellulose from Various Sources and the Effect of Lignification Thereon. To (1) learn the digestibility (in vitro) of cellulose and cellulose-containing crude fiber fractions isolated from feedstuffs (corn cobs, oat hulls, wheat bran, alfalfa leaves and stems, timothy, and straws), (2) try to assess effect of lignification of materials on digestibility of cellulose in these materials.
Anim. Sci. 132 (NC-25)

Okla. — Improving the Utilization of Low Quality Roughages. To determine (1) value of alfalfa ash in utilization of low-quality roughages; (2) mineral deficiencies of roughages, which are improved by addition of alfalfa ash; (3) effective combinations of inorganic elements for more efficient use of low-quality roughages; and (4) practical supplements to supply nutrient deficiencies of low-quality roughages.
Anim. Husb., Agr. Chem. 874

Pa. — The Nutritive Evaluation of Forages. To learn (1&2) digestible dry matter, digestible protein, and digestible energy of forages of particular value in Northeast, using sheep as experimental subjects; (2) above constituents on forages produced by New Hampshire Station for special cooperative studies. Metabolizable energy to be learned on 3 of forages. (3) Compare nutrient values of forages as measured by sheep with those measured by cattle, rabbits, chemical analysis, etc.
Anim. Nutr. 1263 (NE-24)

S. Dak. — The In Vitro and In Vivo Digestibility of Prairie Hay and Other Forages as Related to the Carbohydrate Components. (1) Study the in vitro digestibility of prairie hay and local forages with emphasis on carbohydrate fractions. (2) Conduct digestion trials in conjunction with in vitro studies in order to correlate differences of carbohydrate fraction content with nutritive value of forages.
Anim. Husb. 293 (NC-25)

Tenn. — Factors Affecting Feed Utilization by Ruminants. (1) Learn and evaluate factors influencing rumen microbial activity. (2) Evaluate new chemicals or feed additives and learn their influence on rumen microorganisms and on utilization by ruminants of feeds common to State. (3) Learn methods of altering rate of feed passage thru digestive tract and ascertain what influence rate of feed passage has on feed utilization.
Anim. Husb., Vet. Sci. 71

Utah — Nutritional Deficiencies in Range Forage and the Supplementary Feeding of Range Livestock. To (1) determine the botanical species and chemical composition of the diet of range livestock with special reference to deficient or excessive nutrients and toxic materials, (2) note effect on calf and lamb crop and other production factors after supplementing deficient diets or instituting preventive or corrective measures for diets with excessive or toxic materials which are consumed by range livestock, (3) develop techniques of handling range livestock for detailed experimental research, (4) study methods of determining digestibility and metabolizable energy content of various species and mixtures consumed by cattle on ranges. Sheep may be used for comparisons.

Anim. Husb., Range Mgt. 421 (W-34)

Va. — Intensive Production of Spring Lambs from Pastures. To (1) compare ladino-clover or ladino-grass mixtures with natural bluegrass white clover pastures under conditions of optimum fertility for intensive spring lamb production, (2) study methods of pasture management necessary for maximum production of early spring lambs from pasture, (3) study methods of parasite control necessary to maintain ewes and lambs on pasture under maximum stocking rates, (4) learn methods of control of infectious diseases, such as foot rot, under intensive grazing with sheep, (5) compare continuous with rotational grazing on permanent bluegrass whiteclover pastures with ewes and lambs under intensive stocking rates.

Anim. Husb., Agron., Path. 86064

W. Va. — Measuring the Nutritive Value of Forage Crops. Develop chemical and biological techniques for determination of nutritive value of forage crops.

Agr. Biochem., Agron & Genet., Anim. Husb. 46 (NE-24)

Wyo. — Grazing Studies on Seeded Pastures and Native Range. Learn (1) effect of 3 degrees of forage use of high mountain range on vegetational composition and cattle gains (2) same when fed to sheep, (3) comparison of cattle gains from grazing 3 seeded grass species at optimum period of use with gains from native shortgrass, (4) effect of light use on rate of recovery of overgrazed shortgrass range and sheep gains from pastures as compared with good range lightly and moderately grazed, (5) longevity of certain seeded grass species and sheep gains compared from pastures of these species.

Agron., Anim. Prod. 586 Coop. ARS

Wyo. Range Livestock Nutrition. Determine digestibility of harvested forages and/or supplements used for wintering range livestock and chemical composition and nutritive value of range forage as related to performance of cattle and sheep. Develop more satisfactory methods of range nutrition research; compile and review data on range forage plants, poisonous plants and toxic materials in Wyoming forages.

Anim. Path., Chem. 613 (W-34)

Concentrates

Ill. The Effect of Feeding the Soybean Plant or Its Fractions on Animal Reproduction, Growth, Lactation, and Aging. To (1) learn cause for impaired reproduction and other physiological failures in female rabbit fed a diet composed of 49.5 parts soybean hay, 49.5 parts of ground wheat and 1 part NaCl, (2) extend study to dairy cattle and goats to learn reasons why soybean forage as a nutrient source has lost favor with dairymen in Illinois, (3) study soybean dietary factors as related to vitamins, hormones, and body metabolism.

Dairy Sci. 35-312

W. Va. Methods to Increase Non-Protein Nitrogen Utilization by Ruminants. To evaluate a variety of non-protein nitrogenous compounds which may be useful as replacements for protein concentrates in ruminant rations containing a high proportion of roughage.

Anim. Husb., Biochem. 45

Feed Adjuvants

Calif. The Effects of Hormones on the Growth and Fattening of Meat Animals. To learn (1) types of hormones best suited for increasing growth or carcass quality, (2) most effective dose, (3) influence of age, sex, and dietary conditions on effect of treatment, (4) mechanism by which hormones influence metabolic activities.
Anim. Indus. 1662 Coop. FES

Colo. The Effect of Hormones, Drugs and Similar Substances on Nutrition of Livestock. To learn (1) effect of these substances when fed as part of ration and when administered parenterally on feed lot responses and carcass grade and yield; (2) by individual digestion trials, influence of these substances on digestibility of feeds and efficiency of nutrient utilization; (3) by chemical and/or biological methods natural and added concentrations in feed stuffs of above, by chemical and biological methods residues of same deposited in organs and tissues, by gross and microscopic examination of organs and tissues any effect ascribable to treatment with these substances.
Anim. Indus. 182

S. Dak. The Effect of Hormones on Feed-Lot Performance and Carcass Quality of Growing and Fattening Lambs. (1) Learn rate of gain and feed efficiency made by lambs treated with hormones. Study (2) effect of hormones on carcass quality; (3) effect of hormones on urogenital systems and on body development.
Anim. Husb. 298

Minerals

Calif. Mineral Metabolism in Animals.--I. Molybdenum Toxicity in Ruminants. II. Copper and Molybdenum Relations in Cattle and Sheep. III. Phosphorus Metabolism Using Low and High Phosphorus Forage. IV. Salt Metabolism in Sheep. Tolerance of Sheep to High Intakes of Salt. V. Investigation of Mineral Deficiencies in Range Lands. (1) To study effect of a low phosphorus diet on reproduction; (2) to continue search for a goitrogenic substance in the water from Hat Creek and (3) to study nutritional conditions in various parts of the State where livestock production cannot be maintained at a maximum level on native vegetation alone.
Anim. Husb. 938

Colo. Mineral Nutrition and Biological Efficiency of Livestock Production Phase I. The Progressive Variation of the Calcium: Phosphorous Ratio in Growth, Maturation and Fattening. Learn (1) nature of metabolic Ca:P ratio variation with changing age; (2) relationship of Ca:P ratio with nature and degree of fattening. Study (3) biochemical role of Ca in fat deposition; (4) effect of Ca on digestibility and rate of movement of ingesta through the alimentary tract.
Anim. Indus. 120

Fla. Investigation of Mineral Nutrition Problems of Livestock Through the Use of Laboratory Animals. To investigate mineral nutrition problems, including mineral interrelationships that occur in farm livestock, using suitable laboratory animals.
Anim. Husb. & Nutr. 346

Fla. Transfer of Mineral Elements Through the Placenta and Their Distribution in the Fetus. To determine rate and extent of placental transfer of selected mineral elements and to determine distribution of those elements in the fetus.
Anim. Husb. & Nutr. 566

Ill. Studies of Trace Mineral Requirements and Metabolism in Animals. Investigate requirements for, and functions and metabolism of, trace mineral elements in several species of animals.
Anim. Nutr., Anim. Sci. 20-359

Mo. The Mineral Nutrition of Ruminants. To (1) reevaluate qualitative and quantitative mineral requirements of ruminants, (2) learn mineral element(s) or combination of elements in alfalfa ash which is (are) effective in stimulating appetite and improving performance of cattle and sheep fed low quality roughage, and (3) obtain more data on role of mineral imbalances in etiology of "stiff lamb" disease, urinary calculi, and tetany.
Anim. Husb. 248

N. C. Investigations on the Metabolism of Minerals by Ruminants 1. The Effects of Variations in the Calcium: Phosphorus Ratio on Cattle and Sheep. Learn optimum Ca:P ratio or the range over which the ratio may vary without untoward effects on cattle and sheep performance. (2) Study effects of variations in dietary Ca and P on trace element metabolism of ruminants.
Anim. Indus. 148

Oreg. The Role of Minor Elements in Animal Nutrition. To determine the distribution of "trace" or "minor" elements of importance in animal nutrition and livestock disorders. To apply this information to problems in the fields of nutrition and livestock production.
Agr. Chem. 154

Tenn. Mineral Metabolism in Animals.--I. Absorption, Distribution, and Physiological Behavior of Calcium and Phosphorus in Farm Animals. To (1) determine the normal distribution of these mineral isotopes administered by the various routes to cattle, swine and sheep, and to study thereby in detail the normal absorption, utilization and skeletal metabolism of selected minerals in these animals; (2) measure endogenous losses of calcium and phosphorus and from these values determine maintenance requirements in the various species as a function of age; (3) determine the biological availability of calcium and phosphorus from the common dietary sources of ruminants, and simple stomached animals; and to study the effects of certain factors such as phytates, oxalates, ration, composition, etc. upon the availability; and (4) apply radioisotope procedures concurrently with accepted indicator methods for the differential measurements of animal response to various dietary treatments.
Anim. Husb., Vet. Sci. 63 Coop. AEC

Tenn. Mineral Metabolism in Animals:--II. Interrelationships of Calcium and Phosphorus with Vitamins, Minerals, Hormones, and Other Factors. To (1) investigate and separate effect of metabolism of calcium and P certain important factors which are known to influence their behavior in the animal body; and (2) study such elements and substances as are known to induce abnormal bone metabolism that are important for clarification of normal mechanisms and to aid in explanation of toxicological properties.

Anim. Husb., Vet. Sci. 64 Coop. AEC

Wis. Mineral Metabolism and Mineral Requirement of Animals. To study (1) effect of mineral supplements of various kinds on animals fed low lime rations, (2) role of inorganic compounds containing such elements as Fe, Cu, Ni , Co, Zn, and Mn, and (3) factors responsible for nutritional anemia and effect of various inorganic elements and compounds in correcting such anemias. Fundamental investigations on the phenomena of hemoglobin building on the body will be continued.

Chem., Anim. Husb. 8

Wyo. The Metabolism and Chemical Binding of Selenium in the Tissues. Learn (1) localization and synthesis of organo-selenium compounds in vivo by radio-active selenium; (2) if selenium compounds in plant and animal tissues are similar in structure to sulfur containing amino acids; (3) biological activity of isolated compounds, if chemical combination occurs; (4) site of action of selenium in animal tissues by enzymatic method.

Agr. Res. C. 639

Vitamins

Okla. Correlation of Vitamin A Liver Stores with Plasma Vitamin A in Cattle. (1) Study in sheep the extra-intestinal site of conversion of carotene to Vitamin A; (2) Extend to other species the *in vivo* studies of injected carotene conversion to Vitamin A; (3) Evaluate effect of factors likely to effect carotene conversion to Vitamin A upon the conversion of injected carotene in sheep.

Agr. Chem., Vet. Med. 747 Supplement

Wis. Effect of Vitamins, Amino Acids, and Other Organic Nutrients on the Growth, Milk Production and Reproduction of Animals. To determine factors concerned with the adequate nutrition of farm animals as related to Wisconsin conditions.

Biochem., Anim. Husb. 10

MANAGEMENT

Ill. Control of Sheep and Cattle Parasites. To study various chemotherapeutic practices in the control of sheep parasites.
Vet. Med. 40-335

Mo. Forage Poisoning Caused by Drought. To (1) develop a quick chemical test to predict if forage would be toxic to farm animals, (2) learn if the toxicity of forage declines after ensiling, and (3) study physiological effects of high nitrate intake on farm animals and investigate ways of counteracting the effects.
Chem. 247

N. Y. (Cornell) The Development of Materials Handling Methods and Equipment for Reducing Labor in Caring for Livestock Including Reference to Harvesting, Processing, Storing, and Feeding. To develop suitable methods and equipment for handling materials necessary for livestock feeding and care in order to reduce manual labor now required, so that it should be possible to increase the output per man, hence reduce unit cost of production.
Agr. Engin., Anim. Husb. 35 (NE-13)

Okla. The Control of External Parasites. To (1) develop effective repellents to protect animals from external parasites, especially those with resistance to common toxicants; (2) evaluate effectiveness and hazards of new chemicals as pest toxicants; (3) determine best methods to apply insecticides to animals, especially automatic sprayers, rubbing posts and treadle machines; (4) obtain biological data to assist in above objectives; and (5) obtain adequate data indicating gains to be expected from parasite control.
Anim. Husb. 593

Wyo. Cattle and Sheep Ranch Management for Most Efficient Production. To learn (1) most important factors that influence profits and losses, and methods for their improvement; (2) best management practices under given conditions and methods for bringing about their use on more ranches; (3) proper rate of stocking for maximum beef, lamb, wool, and forage production over a period of years; (4) best winter feeding practices for most economical production; (5) proper balance between feed resources and animal units, feed costs and livestock prices, feeder prices and slaughter prices, and proper adjustments between price and what the producer received per pound, and cost per pound for feedlot gains; and (6) proper amount of investment in different enterprises on ranch and its percent of all costs.
Agr. Econ. 500

CARCASS EVALUATION AND MEAT

Ga. Carcass and Meat Characteristics as Influenced by Breeding, Feeding and Management Treatments in Cattle, Sheep and Swine. (1) Obtain data on carcasses fattened on grass, drylot, or combinations of these under local conditions. (2) Study relationship of breeding, feeding, and management treatments on carcass and meat characteristics. (3) Use above data in developing procedures for producing meat for consumer preferred type animals.
Anim. Indus. 113

Ill. Carcass Quality of Lambs as Affected by Different Feeds and Feeding Practices. Study effect on carcass quality of lambs of physical form and chemical composition of fattening rations.
Anim. Sci. 20-331

Iowa The Influence of Dietary Supplementation Selection and Breeding on Carcass Quality, and Tissue Composition of Meat Animals. To determine (1) effects of protein, fat, antibiotics, trace minerals, calcium and phosphorus of rations on carcass quality and tissue composition; (2) effect of roughage, protein and protein substitutes, and hormones on quality of lamb and beef carcasses; and (3) make additional studies, largely biochemical, to support objectives above.
Anim. Husb. 1239

Kans. The Effects of Implanting Stilbestrol in Feeder Lambs and Feeding a Stilbestrol Pre-Mix to Feeder Lambs upon the Quality and Palatability of the Carcass. Obtain information regarding body changes when stilbestrol is implanted in or fed to feeder lambs.
Anim. Husb., Chem., Foods & Nutr. 423

Ohio Studies in the Processing of Fresh Meat -- Biochemical and Bacteriological Studies Fundamental to the Processing of Fresh Meat. To find methods of processing fresh meat which will upgrade the less desirable carcasses; permit greater quality control along the lines of palatableness; diminish the great variation in consumer acceptability resulting from breeding, nutrition, and handling; augment effectiveness of refrigeration in preserving meat; and prevent certain spoilage such as "bone sour".
Anim. Sci. 70

Utah — Chemical Techniques for Detecting Flavor Changes During Meat Processing. Develop chemical techniques for rapid and reliable evaluation of flavor of processed meat. Correlate chemical techniques for evaluating flavor of same with organoleptic test on man.
Bot. & Plant Path., Foods & Nutr. 458

Wash. — Identification of the Components of Flavor in Lamb and Mutton and Application of this Information Toward Increased Utilization of these Meats. (1) Investigate components of flavor of fresh and cooked lamb, and mutton, and their intensity by use of chemical, physical, and sensory techniques of identification. (2) Learn effects of method of cookery on their flavors. (3) Study effects of breeding and management on the quality of lamb and mutton.
Home Econ. 1375

WOOL TECHNOLOGY AND MARKETING

Colo. Marketing Colorado Wool. Learn: (1) feasibility of marketing Colorado wools on a descriptive basis; (2) possibilities and limitations of pre-marketing preparation of Colorado wools. (3) Classify sources and volumes of wool supplies, by major grades in State. (4) Learn, describe and analyze wool marketing practices of growers, buyers, auctions, cooperatives, and warehouses in Colorado.
Anim. Indus., Econ. & Sociol. 203 (WM-23)

Mont. Measurements for Use in Marketing Wool. Learn value of objective physical measurements for use in marketing of wool.
Agr. Econ., Anim. Husb. 949 (WM-23)

Mont. Grading and Selling Pooled Wool in Montana. To learn (1) feasibility of grading wool from local wool pools for market, (2) relationships existing between price received, size of lot, and marketing channels available.
Agr. Econ. 957

Mont. The Relative Value of Wool Containing Varying Amounts and Forms of Vegetable Matter. Learn (1) effects of varying amounts and forms of vegetable matter in wool: on processing costs, quantity and quality of processed products; (2) relative values of these wools at farm level as affected by: processing costs, and quantity and quality of processed products.
Agr. Econ. & Sociol. 1006

N. Mex. Marketing New Mexico Wool. (1) Learn economic possibilities and limitations of pre-marketing preparation of New Mexico wools. (2) Develop objective standards for degrees of yellowness and learn economic importance of yellow color in grease wool. (3) Learn feasibility of marketing grease wools on a descriptive basis. (4) Describe and analyze market practices of growers, buyers, auctions, cooperatives, and warehouses. (5) Classify sources and volumes of wool produced in State by major grades of wool. (6) Analyze market channels for wool in terms of functions and costs.
Agr. Econ., Anim. Husb. 28 (WM-23)

Ohio Market Outlets and Marketing Procedures for Ohio Wool. To study the marketing procedures used to market wool and lambs produced by Ohio farmers and to determine if improvements can be made in efficiency of marketing wool and lambs.
Agr. Econ. 121-1

Oreg. Economic Importance of Grease Wool Characteristics in Marketing Oregon Wools. (1) Correlate influence varying amounts of colored fibers have on market value of grease wools. (2) Test objective physical measurements on wools and learn how they may be used for more efficient marketing. (3) Evaluate wool marketing practices of growers as they relate to grease wool characteristics.
Dairy & Anim. Husb. 5 (WM-23)

S. Dak. Methods and Economics of Marketing Higher Quality Wool from Farm Flocks. (1) Learn how various handling and marketing practices on farm produced wool will effect returns to growers. (2) Develop practical and economical methods of preparing fleeces so as to improve quality and marketability. (3) Learn how sheep management practices influence quality and value of wool.
Agr. Econ., Anim. Husb. 315

Texas Marketing Fine Wool on a Quality and Mill Performance Basis. To determine (1) the more valuable characteristics of Texas fine wools to the manufacturer, and (2) the economic significance of these physical properties in the market.
Agr. Econ. & Sociol., Anim. Husb. 996 (WM-23)
Coop. AMS

Utah The Value of Objective Physical Measurements for Use in Marketing Wool. Develop methods of preparing, sampling, and measuring wool as basis for describing wool for marketing. Learn economic limitations of application of objective physical measurements in describing grease wool for marketing.
Anim. Husb. 468 (WM-23) Coop. AMS

Wyo. Wool Character -- Price Relationships and Economics of Marketing Wyoming Wools. (1) Measure relation between physical characters of grease wools and their processed products and respective market values. Learn: (2) commercial potentialities of using above objective measurements as aids in selling grease wools on the market; (3) types and grades of grease wool produced in Wyoming and values received for them by growers; (4) describe and analyze State wool marketing practices and channels.
Wool 706 (WM-23)

Wyo. Impairment of Wool Through Deterioration and Contamination. (1) Study effect of previous environmental influences on performance of wools in processing. (2) Measure the extent of various sources of black fiber contamination.
Agr. Econ. ES-535

REGIONAL PROJECTS

NC-25 Factors Affecting the Utilization of Feed by Ruminants. To improve the utilization of roughage, the basic constituent of ruminant rations by: (1) Determining the utilization of carbohydrate fractions, including the end products of fermentation (e.g. organic acids). (2) Determining protein and/or non-protein nitrogen requirements and utilization under different feeding conditions and different types of production. (3) Determining the requirement and physiological functions of minerals as well as their content in various feeds, with particular emphasis on the minor elements. (4) Determining the identity and the quantitative requirements of unidentified factors. (5) Determining methods of making more efficient use of rumen microorganisms.

Contributing projects: Ill. III-A, Iowa II-C, Kans. II-C, Mich. III-B, Mo. III-A, Nebr. III-B, N. Dak. II-C, Ohio III-B, S. Dak. III-B.

See also Section a: Beef Cattle - Ill., Ind., Minn. (All projects in III-B.)

NC-27 Causes and Control of Bloat in Ruminants. To (1) determine the physical and chemical characteristics of alfalfa and Ladino clover and fattening rations associated with bloat; (2) determine the physical and chemical characteristics of rumen ingesta from normal and bloated animals; (3) study the physiologic responses of ruminants to bloat-producing feeds, chemicals and procedures; (4) develop and elucidate measures for the control of bloat.

Contributing projects: Ind., Iowa, Mich., Minn., Ohio, S. Dak. (All projects in II-C.)

NE-24 The Nutritive Evaluation of Forages. To (1) evaluate various forages grown under known conditions and harvested at specific stages of maturity by determining digestible protein and digestible energy; (2) develop methods for the nutritive evaluation of forages: these to include the use of small animals and chemical analyses; (3) conduct animal production trials simultaneously insofar as possible.

Contributing projects: Del., Maine, N. J., N. Y. (Cornell), Pa., W. Va. (All projects in III-B.)

See also Section a: Beef Cattle - Md., Mass., N. H., N. Y. (Cornell), R. I., Vt. (All projects in III-B.)

S-29 Improving the Production of Early Milk Fat Lambs. Development of systems of breeding and management of sheep that will result in earlier lambing, increased productive efficiency, and greater adaptation to the environmental conditions of the southern region through a. breeding methods to effect permanent genetic changes including selection, inbreeding, crossbreeding, and recurrent selection; b. the use of exogenous hormones to control the reproductive processes; c. study of the effects of environmental factors to determine optimum environment for maximum reproductive efficiency.

Contributing projects: Ala., Ark., Ky., N. C., Tenn., Va. (All projects in I.)
See also, Fla., Ga., Miss., S. C. (All projects in II-B.)

W-34 Range Livestock Nutrition. To determine the quantitative and qualitative nutritive value of range forage consumed in terms of chemical analysis, botanical classification, soil, site, stage of maturity, season, drouth, and digestibility relating these factors to reproductive performance growth and market value of range cattle and sheep.

Contributing projects: Calif., Colo., Hawaii, Idaho, Nev., Utah, Wyo. (All projects in III-B.)
See also Section a: Beef Cattle - Mont., N. Mex., Oreg., Wash. (All projects in III-B.)

W-46 The Effects of Environmental Stresses on Range Cattle and Sheep Production. To (1) test physiological measures as suitable criteria in the evaluation of stresses resulting from nutrient restriction, altitude and temperature; and (2) develop economical methods of alleviating the stresses of nutrient restriction, altitude and temperature on growth and reproduction of range cattle and sheep.

Contributing projects: Ariz., Calif., Colo., Idaho, Nev., N. Mex., Oreg., Utah. (All projects in II-A.)
See also Mont. II-B, Wyo. II-B.

WM-23 Improving the Marketing of Western Wool. To (1) correlate the physical characteristics of specific grades and types of western wools with their combing performance and market values; (2) test the usefulness of objective measurements of grease wool for use in marketing the product on a merit basis; (3) determine, describe and analyze wool marketing practices and functions of the growers, buyers, auctions, cooperatives and warehouses in the various producing areas of the western region; (4) classify the sources and volumes of wool supplies by major grades in the western States.

Contributing projects: Colo., Mont., N. Mex., Oreg., Texas, Utah, Wyo. (All projects in VI.)

OTHER REGIONAL RESEARCH PROJECTS IN RELATED FIELDS MAY BE FOUND IN OTHER PARTS OF THE COMPILATIONS AS FOLLOWS:

NC-47 Evaluation of Breeding Systems for Chickens
See Part 19.

NE-13 The Mechanization of Forage Crop Harvesting, Processing, Storing, and Feeding
See Part 3, Sections b and c.

S-12 Forage Crop Production and Evaluation
See Part 10.

W-16 Economics of Range Land Development
See Part 2, Section b.

LIST OF COMPILATIONS OF FEDERAL-GRANT RESEARCH PROJECTS
AT STATE AGRICULTURAL EXPERIMENT STATIONS

ARS-23-8: Part Numbers	Subject-Matter Area	Title of Section
1	Agricultural Chemistry	Agricultural Chemistry
2	Agricultural Economics	a. Prices, Incomes, & General Studies of Commodities & Industries b. Farm Management c. Land Economics d. Farm Finance & Taxation
3	Agricultural Engineering	a. Land & Water Use & Development b. Power Machinery & Equipment c. Farm Structures & Materials
4	Animal Husbandry	a. Beef Cattle b. Sheep & Goats c. Swine
5	Dairy Husbandry	Dairy Cattle
6	Dairy Technology	Dairy Technology
7	Entomology & Economic Zoology	a. Field Crop Insects b. Fruit, Nut & Vegetable Insects c. Miscellaneous Insects & Economic Zoology d. Insecticides
8	Field Crops	a. Cereal Crops b. Oil, Fiber, Tobacco & Sugar Crops
9	Food Science & Technology	a. Food Chemistry, Microbiology, Sanitation & Public Health b. Food Engineering, Processing, Product and Process Development, Utilization and Waste Disposal c. Food Quality & Standards, Acceptance, Preference, & Marketing
10	Forage Crops, Pastures & Ranges	Forage Crops, Pastures & Ranges
11	Forestry	Forestry

ARS-23-8: Part Numbers	Subject-Matter Area	Title of Section
12	Fruits & Nuts	Fruits & Nuts
13	Home Economics	a. Human Nutrition b. Housing c. Clothing & Textiles d. Foods-Consumer Quality & Utilization e. Household Economics & Management
14	Economics of Marketing	a. Field Crops b. Fruits & Vegetables c. Livestock, Meats & Wool d. Dairy Products e. Poultry & Poultry Products f. Forest Products & Ornamental & Drug Plants g. Cross-Commodity & Functional Studies
15	Meteorology	Meteorology
16	Ornamental & Drug Plants	Ornamental & Drug Plants
17	Plant Pathology & Bacteriology	a. Plant Pathology, Botany, & Diseases of Miscellaneous Crops b. Diseases of Field Crops c. Diseases of Fruit Crops d. Diseases of Vegetable Crops
18	Plant Physiology & Nutrition	Plant Physiology & Nutrition
19	Poultry Industry	Poultry Industry
20	Rural Sociology	Rural Life Studies
21	Soils	a. Soil Chemistry & Microbiology b. Soil Fertility, Management & Soil-Plant Relationships c. Soil Physical Properties, Conservation & Classification
22	Vegetables	a. Vegetable Crops b. Potatoes
23	Veterinary Science	Veterinary Science
24	Weeds	Weed Control